COASTAL AQUACULTURE DEVELOPMENT IN CENTRAL JAVA INDONESIA
ITS PROSPECT AND PROBLEMS*)

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Introduction :

Coastal Aquaculture is the culture systems of marine and brackishwater organisme which are cultured in the coastal waters area., it is commonly called in Central Java Indonesia by "tambak culture" The development of coastal aquaculture in Central Java Indonesia has recently attracting more attention by Ministry of Marine Affair and Fisheries, Directorate General of Aquaculture through the programe namely :"Revitalization Of Indonesian Aquaculture". It has been launched in the year of 2004,due to the fact that potency of available resources have not been used optimally for suporting economics growth . .Aquaculture business activities are believed to be prime mover for economics growth of the country,especially during these global economics crisis. Furthermore, in term of potency areal available,geographical and climate condition,living resources, productivity level,prospective domestic and global market, coastal aquaculture development is the future promising business activities for Central Java.. It is therefore the development strategics should be resumed in order to change the comparative advantages available to be the advantages of competitive aquaculture products. Meanwhile,several problems have already occurred in accelerating coastal aquaculture development in Central Java such as degradation of environmental culture sytems due to increasing of the use of intensive technology,water pollution and ultimately will increase disease out break in the tambak systems.The other problems are : limiting adoption of science and aquaculture technology, lack of supporting capital from finance institutions, lack of regulation for general spatial planning in coastal area, misuses of local government policy, marketing problems due to: consumer preference, high production cost,varying selling price, high level of standard product quality determined by wholesalers and issues of environmental friendly and food safety.

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Development of coastal aquaculture in Central Java would be,therefore, directed to achieve several target as follows :

a Increasing of fish consumption

b Increasing income per capita of culturist

c Improving the business and export commodity produced by sustainable aquaculture

d Reducing the use of coastal resources

e Increasing the restocking of marine and brackishwater species in the coastal area

f Continous supply of resource for fisheries industry

g Maintaining environmental sustainability

To discuss in detail the prospect , potency and problems of Coastal Development in Central Java Province, it will be described as follows :

Geographical And Climate Status Of Central Java :

- Total Areal of Central Java : 32.284.268 Km2 (23,97 %) of Java Island;
- Position: 5°30' LS and 108°30' BT - 111°- 30‘ BB;
- Average maximum temperature 30,7 ° C
- Average humidity 24,7 %
- Rainfall range from 1.547 to 3.989 mm/tahun
- Coastal line : 656,10 km, consist of northern central java: 453,9 km and southern central java 202,2 km

Profile of Coastal Aquaculture in Central Java from 2002 - 2006

- The areal increased by 3,6 % / th, from 42.758,30 Ha to 51.353,10 Ha
- Total production increased by 4,75 % / th, from 78.689,80 ton to 101.080,90 ton, in value Rp. 1.190.390.742.000,- (58,31 % come from tambak production and 14,15 % from mariculture production).
- Exported coastal acuaculture commodity increases by 4,02 %/th, from 14.542.669,26 kg, in value US $ 60.072.787,58 to be 17.064.736,82 kg, in value of US$ 70.614.933,33

POTENCY OF AREAL FOR COASTAL AQUACULTURE DEVELOPMENT IN CENTRAL JAVA

Potensial Area For Mariculture :

No	Commodity	Potency (Ha)	
		Indicatif	Effectif
1	Fin Fish	89.8	5
2	Sea weed	898.4	269
3	Mollucs	33.7	0
4	Abalone	11.2	0.5
5	Sea Cecumbar	33.7	0
6	Pearl	156.1	0.51
	Total	1.123	275

Source: Master Plan of Coastal Aquaculture Development 2004
The most potensial area for mariculture are in Karimun Java Island – Central Java

Potensial Area for Brackishwater Ponds (tambak) :

No	District	Wide of Area (ha)		
		Existing	Potensial	
1	Brebes	7563	9454	
2	Tegal	423	448	
3	Kota Tegal	440	443,0	
4	Pemalang	1347	1585	
5	Pekalongan	163.3	180	
6	Batang	245,5	294,5	
7	Kendal	3054	3394	
8	Kota Semarang	824	1030	
9	Demak	6514	7237,8	
10	Pati	9544	10604	
11	Jepara	980	1065,5	
12	Rembang	1192	1655	
13	Jateng bag selatan	373,3	4687,8	
		37.704,70	42.119,70	

Source: Statistic Figures of Coastal Aquaculture in Central Java, 2006

Production Level of Coastal Aquaculture Commodities and its Value (Rp) :

No	Commondity	Year 2007		
		Production (Ion)	Value (rb)	
1	Grouper	9	484.707	
2	Sea weed	3047,7	7.619.250	
3	Milkfish	39.428,4	316.724.302	
4	Red snapper	517,4	5.275.350	
5	Tiger prawn	6.324,7	339.363.690	
6	White prawn	1.992,8	15.697.159	
7	Crabs	851,2	15.656.222	
Total		52.171,2	701.117.680	

Source : Statistic Figures of Coastal Aquaculture Central Java, 2006

Development of Tambak Production from 2002 to 2006

Culture Tambak	Year					Increment
	2002	2003	2004	2005	2006	(% Thn)
Areal(Ha)	34.909,10	34.973,10	37.600,30	38.910,70	42.119,70	3,6
Production(Kg)	49.786,40	58.008,40	57.293.80	52.381,30	58.935,40	2,93
Value (Rp 1000)	636.638.603	621.665.526	694.097.429	671.977.425	836.362.435	4,39
Fisher Household	21.744	24.358	24.885	23.239	24.639	2.2

Development of Mariculture Production from 2003 to 2006

Culture metodhe Mariculture	Year			
	2003	2004	2005	2006
Areal (Ha)	156	260	275	275
Productioni (Kg)	1.876.45	3.248,28	2.531,80	1.854,0
Value (Rp. 1000)	898.256	1.624.140	1.265.875	1.234.560
Fisher Household	186	197	200	222

Problems of Coastal Aquaculture Development in Central Java

1. Site selection and spatial planning
2. Suitable areal and spatial planning regulation
3. Increasing of feed price
4. Increasing of fuels price
5. Limiting of seed suply for mariculture
6. Lack of investment availability

VISION OF COASTAL AQUACULTURE DEVELOPMENT

TO MAKE COASTAL AQUACULTURE TO BE THE MOST PROMINENT ACTIVITIES TO SUPPORT ECONOMICS GROWTH OF THE COUNTRY THROUGH COMPETITIVE CULTURE SYSTEMS, SUSTAINABLE AND EQUAL BUSSINESS OPPURTUNITY

MISSION

- *TO PROVIDE STAPLE FOOD,MATERIAL FOR AQUACULTURE INDUSTRIES AND IMPROVING EXPORT COMMODITY*
- *TO IMPROVE CULTURE ACTIVITIES BASED ON RESOURCES ,KNOWLEDGE AND ENVIRONMENTAL FRIENDLY*
- *TO CREATE JOB AND BUSSINESS OPPORTUNITIES*
- *TO CREATE A CONDUSIVE BUSSINESS ATMOSPHERE*
- *TO IMPROVE ENVIRONMENTAL CULTURE SYSTEMS*

PROSPECT FOR COASTAL AQUACULTURE DEVELOPMENT

- By improvement of main commodity productivity such as :

PRAWN/SHRIMP, GROUPER, ABALONE and SEAWEED

Through:

- Land intensification and extentsification
- Implementation of aquaculture technology
- Genetic engineering for seed production
- Development of aquaculture area

Comparative Advantages of Aquaculture :

- Aquaculture can be done by all community level (*small scale or big scale)*
- Profitable activity
- Availability of backward and forward linkage
- Reducing poverty level
- Aquaculture technology are readily available
- Export commodity and local commodity

Future Prospect of Indonesian Coastal Aquaculture (2010) :

- WORLD POPULATION IS PREDICTED 6,9 BILL, APPROXIMATELY INCREASES 15 % FROM THE YEAR 2000.
- AGRICULTURE LAND AVAILABILITY WILL REDUCE FOR ± 15% FROM THE YEAR 2000
- EXISTING CONDITION

TAHUN	Ha/Person
1965	4,00
1975	3,33
1985	2,78
1995	2,38
2005	2,08
2010	1,96

(source: United Nation World Population Prospect,2006)

- BLUE REVOLUTION HUMAN ARE MOVING TO THE SEA
- CHANGING IN LAND UTILIZATION: FROM PRODUCTIVE LAND TO INFRASTRUCTURE AND HOUSING
- THE NEED OF RICE IN THE YEAR 2025: 800 MILL TONNES
- PRODUCTION ONLY 600 MILL TONNES
- DEFICIT 200 MILL TONNES
- AQUACULTURE: WILL BE THE RIGHT CHOICE

The Future Of Coastal Aquaculture :

1. TREND WORLD FISHERIES PRODUCTION
2. NEED IMPROVEMENT
   - *Older Generation*
   - *People on the Run*
   - *Food to become more International*
3. PROBLEMS OF LAND BASED MEAT (MAD COW DISSEASSES, ANTRAX & AVIAN INFLUENCA)

FISH WILL BECOME MORE IMPORTAN COMMODITY FOR GLOBAL COMMUNITY

AQUACULTURE POLICY :

- Improvement of aquaculture activities with main/important commodities in unused aquaculture land
- Providing jobs and economics activities giving a multiplier effect as a results of aquaculture activities
- Implementation of environmentally friendly aquaculture technology to overcome water quality problems
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PROGRAMME :

1. Improvement of aquaculture production for export purposes (PROPEKAN)
2. Improvement of aquaculture production for consumption (PROKSIMAS)
3. Conservation and rehabilitation of aquaculture resources (PROLINDA)

STRATEGIES :

- Utilization and optimalization of existing ponds
- Utilization and optimalization of existing hatcheries
- Fazilitating partnership
- Providing Vannamei prawn broodstock
- Implementation of standard ,certification and seed quality monitoring
- Dissemination and demonstration pond
- Coordination with related institutions

REVITALIZATIOAN STRATEGIES FOR PRAWN AQUACULTURE :

- Development of vannamei prawn culture since this commodity is more adaptive to the environment, less succeptible to diseases and high productivity
- Development of tiger prawn culture through implementation of simple technology or organic technology

TARGET OF PRAWN CULTURE PRODUCTION (2009) :

- Production : 9.148,5 tonnes 6.957,2 tonnes tiger prawn and 2.191,3 tonnes vannamei
- Area : 150.500 Ha
- Employeement : 24.316 people
- At 12 provinces

Production facilities needed :

SEED : Requirement of prawn seeds up to 2009: 521,99 million

BROODSTOCK : Imported vannamei prawn broodstcok

SEED QUALITY : Standardization of seed production

FEED:

- 50-60 % OF TOTAL COST
- MAINLY FROM FEED PRODUCERS
- DEVELOPMENT OF ALTERNATIVE FEED
- REDUCING FEED PRICE BY USING LOCAL RAW MATERIALS

FERTILIZER

- Need to be careful when using fertilizer
- Organic: chicken manure is not recommended since its content residu of chemicals
- Inorganic: influencing land productivity

DRUGS : 45 produCTS: feed additive, antibiotic, vaccine, probiotic and vitamine.

OTHER FACILTIES AND FUELS

Revitalization of seaweed aquaculture

TARGET 2006 :

- Production : 1.12 mill tones
- 235.789 tones *Gracillaria and* 884.211 toned *Euchema*
- Area : 18.220 Ha
- 5.895 Ha *Gracillaria and* 8.842 *Eucheuma*
- Employment : 150.315 people
- Provinces: 7 province *Gracillaria and* 23 province *Eucheuma.*

PROJECTION OF SEAWEED AQUACULTURE DEVELOPMENT :

No	Parameter	Year			
		2006	2007	2008	2009
1	Production (tonned)	1.120.010	1.343.696	1.611.911	1.900.000
	- *Gracillaria* sp.	235.800	282.880	339.360	400.000
	- *Euchema* sp.	884.210	1.060.816	1.272.631	1.500.000
2	Area (ha)	18.220	21.453	25.336	29.283
	- *Gracillaria* sp.	5.895	7.072	8.484	10.000
	- *Euchema* sp.	8.842	10.608	12.726	15.000
	- Addition *Euchema* sp.	3.483	3.773	4.126	4.283
3	Sea weed seeds	1.474	1.767	2.121	2.500
	- *Gracillaria* sp.	590	707	848	1.000
	- *Euchema* sp.	884	1.060	1.273	1.500
4	Investation	46.200	54.000	65.600	70.300
	- *Gracillaria* sp. (Rp. Juta)	1.900	1.800	2.100	2.300
	- *Euchema* sp. (Rp. Juta)	44.300	53.000	63.500	68.000
5	Pre-Processing (unit)	88	106	127	150
6	Employment	150.315	180.336	216.342	255.000

OPERATIONAL POLICY **:**

1. Development of ’pilot project’
2. Introduction of good quality of seed
3. Establishment of ’Seaweed Center’
4. Implementation of aquaculture standard methode
5. Improvement of post harvest quality

REVITALIZATION OF MAIN AQUACULTURE COMMODITY :

DEVELOPMENT STRATEGIES

1. Development of aquaculture area
2. Implementation of sustainable technology
3. Providing good quality of broodstock
4. Aqua-business approach

DEVELOPMENT OF GROUPER CULTURE ., due to the fact that grouper are :

1. Well known in foreign countries
2. Economically important commodity
3. Aquaculture technology has been developed
4. Segmentation of aquaculture activities

PROJECTION OF GROUPER PRODUCTION :

No	Parameter	Year				
		2005*)	2006	2007	2008	2009
1	Production (tones)	7.200	8.000	9.600	11.520	13.820
	- Local	2.880	3.200	3.360	3.460	3.460
	- Export	4.320	4.800	6.340	8.060	10.370
2	Area (Ha)	150	160	200	240	280
3	Seeds (x 1000 ek)	18.460	20.510	24.620	29.540	35.450
4	Broodstock (ek.)	990	1.100	1.300	1.600	1.900
5	Feeds (tones)	36.000	40.000	48.000	57.600	69.120
6	Seed prod unit	140	160	200	230	280
7	Employment	16.290	18.100	21.720	26.060	31.270

DEVELOPMENT OF MILK FISH CULTURE , based on :

1. Export and domestic market opportunity
2. Development of intensive and extensive aquaculture
3. Segmentation of the businnes is quite wide spread all over the country

PROJECTION OF MILK FISH PRODUCTION :

No	Parameter	Year				
		2005*)	2006	2007	2008	2009
1	Production (tones)	285.000	320.000	360.000	400.000	475.000
	- Local	256.500	288.000	306.000	340.000	380.000
	- Export	28.500	32.000	54.000	60.000	95.000
2	Area (Ha)	110.490	124.050	128.090	129.130	132.680
3	Seeds (x 1000 ek)	1.387.040	1.557.380	1.753.370	1.868.280	2.172.480
4	Broodstock (ek.)	4.110	4.610	4.070	5.160	5.410
5	Feeds (tones)	110.580	124.160	171.650	223.200	315.400
6	Seed prod unit	320	360	410	440	520
7	Employment	124.220	139.470	145.770	149.760	156.670

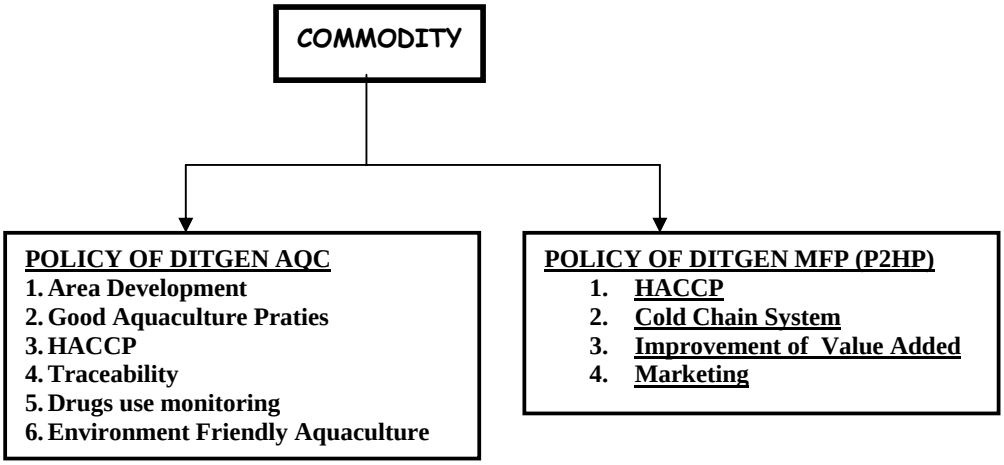
DEVELOPMENT OF ABALONE AQUACULTURE, due to the facts that abalone is :

1. High export demanding
2. Jewelleries material
3. The technology of abalone culture has been developed

Projection Of Abalone Production :

No	Parameter	Year				
		2005*)	2006	2007	2008	2009
1	Production (ton)	1,5	10	50	150	500
2	Seeds (x 1000 ek)	75	500	2.500	7.500	25.000
3	Feeds (ton)	45	300	1.500	4.500	15.000
4	Culture unit	10	60	310	940	3.130
5	Seed prodcution (unit)	-	1	2	3	3
6	Employment	30	190	940	2.820	9.380

PRODUCTION STRATEGY



Export Projection Of Aquaculture Production (Tones) :

No	Commodity	2005	2006	2007	2008	2009	Mean (%)
1	Prawn	105.690	134.264	169.933	209.094	256.414	24,82
2	Sea Weed	76.175	97.241	123.726	157.032	195.375	26,56
3	Grouper	4.320	4.800	6.240	7.875	10.365	24,73
4	Red Tilapia	9.310	13.500	17.850	23.800	29.250	33,37
5	Cat fish	680	2.423	4.888	8.330	13.388	122,29
6	Milk Fish	5.700	12.800	21.600	32.000	47.500	72,47
7	Gouramee	284	939	1.720	2.660	4.050	105,18
8	Patin	701	1.700	3.226	5.151	7.756	85,61
9	Ornamental Fish	750	1.500	2.520	3.888	5.610	66,64
10	Abalone	2	10	50	150	500	350,00

Projection of Export Valued (US x 1000) :

No	Commodity	2005	2006	2007	2008	2009	Mean (%)
1	Prawn	842.790	1.097.849	1.424.410	1.796.190	2.256.790	27,94
2	Sea Weed	46.868	63.934	86.359	115.727	151.331	34,07
3	Grouper	64.800	72.000	93.600	118.125	155.475	24,73
4	Red tilapia	51.916	79.320	110.849	156.753	205.121	41,20
5	Cat fish	952	3.392	6.843	11.662	18.743	122,29
6	Milk Fish	15.390	34.560	58.320	86.400	128.250	72,47
7	Gouramee	1.136	3.756	6.880	10.640	16.200	105,18
8	Patin	1.403	3.400	6.452	10.302	15.513	85,61
9	Ornamental Fish	4.500	9.000	15.120	23.328	33.660	66,64
10	Abalone	90	600	3.000	9.000	30.000	350,00

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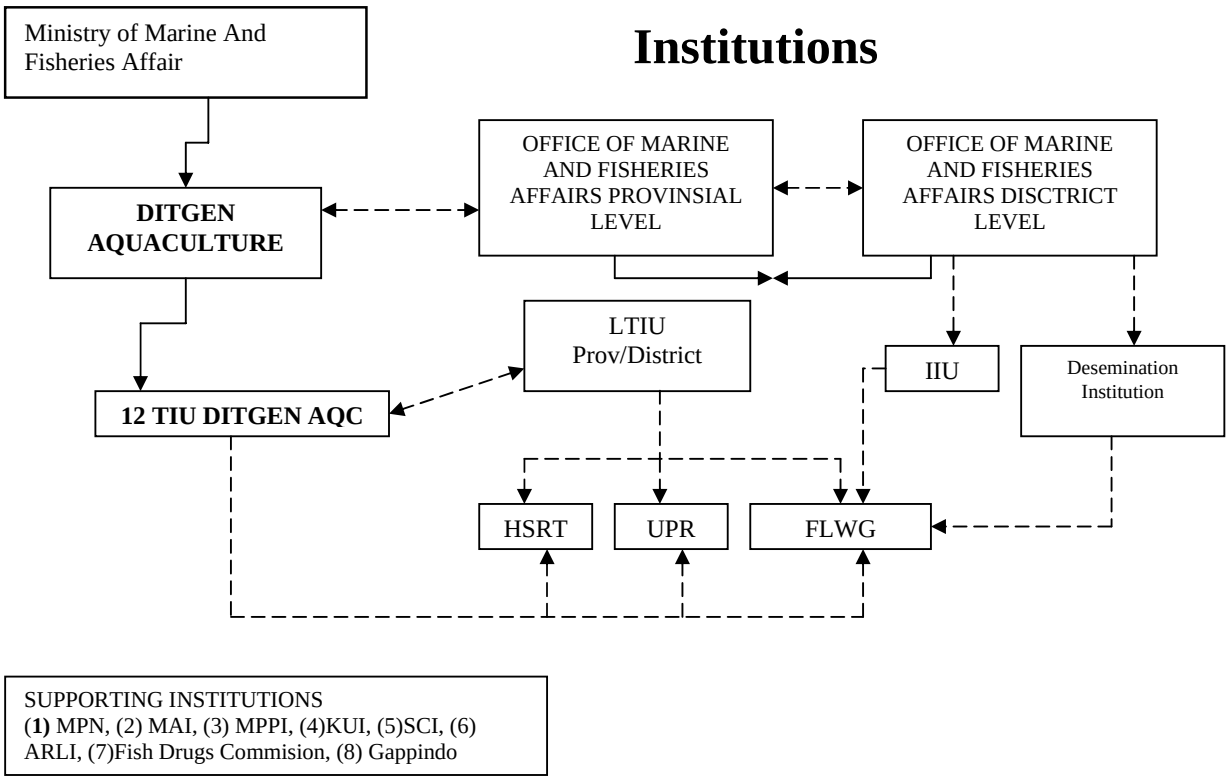

Conclusion :

The coastal aquaculture development in Central Java is very demanding business activities , the potensial areal for intensification and extensification aquaculture are still widely available either for mariculture or tambak culture. These have also supported by good climate and geographical condition resulting to the high level of primairy productivity in the culture systems

The central government policy issued by Ministry of Marine Affairs , through the Directorate General of Aquaculture has recently launched the Programme of Revitalization of Indonesian Coastal Aquaculture based on : Improving Areal for Coastal Aquaculture Development, the use of Good Aquaculture Practices, Application of HACCP for Export Commodity, Traceability for every Exported Aquaculture Products, Intensive monitoring for drugs use and culture systems and application of Environment Friendly Aquaculture.

This programmes have to be adopted by Central Java Provincial Government in order to improve the national fisheries production level on high quality and safety products either for domestic consumption or export commodity